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DISCOVERER PERFORMANCE

DISCOVERER NUMBER	VEHICLE NUMBER	CAPSULE NUMBER	INSTRUMENT NUMBER	INSTRUMENT TYPE	THOR NUMBER	PAYLOAD WEIGHT FLOWN	PAYLOAD WEIGHT TRANSFERED	RECEIVING INSPECTION AT "A/P"	SHIPPED FROM "A/P"	FLIGHT DATE	WEEKS AT "A/P"	DAYS AT "A/P"	TOTAL WEEKS TILL FLIGHT	RECOVERED	SUMMARY
I	1022				163					2-28-59					NO CAPSULE FLOWN
II	1018			BIO.	170					4-13-59					CAPSULE EJECTED OVER SPITZENGERGEN 4-13-59
III	1020			BIO.	174					6-3-59					AGENA FAILED TO ORBIT
IV	1023	102	4	C	179	16 LBS.	O	5-5-59	5-29-59	6-25-59	3	7	7	NO ORBIT	AGENA FAILED TO ORBIT
V	1029	111	7	C	192	20 LBS.	0.405	6-5-59	7-23-59	8-13-59	6	9	6		LOW TEMPERATURES — NOT RECOVERED INSTRUMENT FAILED ON REV. (1)
VI	1028	105	6	C	200	16 LBS.	0.108	5-18-59	6-3-59	8-19-59	2	13	2		RETRO ROCKET MALFUNCTION - NOT RECOVERED INSTRUMENT FAILED ON REV. (2)
VII	1051	109	10	C	206	10 LBS.	O	6-24-59	7-23-59	11-7-59	4	1	19	3 NO ORBIT	AGENA FAILURE — NO ORBIT
VIII	1050	107	9	C	212	10 LBS.	O	7-25-59	11-7-59	11-20-59	15	0	15	13	ECCENTRIC ORBIT - WRONG ALTITUDE INSTRUMENT FAILURE - NOT RECOVERED
IX	1052	113	8	C	218	10 LBS.	O	6 28-59	1-10-60	2-4-60	28	0	31	4 NO ORBIT	AGENA FAILED TO ORBIT
X	1054	110	13	C	223	10 LBS.	O	12-7-59	2-4-60	2-19-60	8	3	10	4 NO ORBIT	AGENA FAILED TO ORBIT
XI	1055	103	14	C	234	16 LBS.	16 LBS.	1-11-60	2-24-60	4-15-60	6	2	13	3	SPIN ROCKET FAILURE - NOT RECOVERED INSTRUMENT OPERATION O.K.
XII	1053	104 2	N/A	N/A	DIAGNOSTIC		O			6-29-60				NO ORBIT	AGENA FAILED TO ORBIT — DIAGNOSTIC
XIII	1057	152 2	N/A	N/A	DIAGNOSTIC		O			8-10-60				8-11-60	SUCCESSFUL WATER PICK-UP — DIAGNOSTIC
XIV	1056	101 MOD 2	3	C	237	20 LBS.	20 LBS.	1-28-60	3-28-60	8-18-60	8	3	28 — 6	8-18-60	SUCCESSFUL AIR CATCH INSTRUMENT OPERATION O.K.
XV	1058	108 MOD 2	11	C	246	20 LBS.	20 LBS.	2-22-60	8 25-60	9-13-60	26	2	29 — 0		VEHICLE PITCH ATTITUDE IMPROPER AT RE-ENTRY. CAPSULE SUNK BEFOR RECOVERED - INSTRUMENT OPERATION O.K.
XVI	1061	506 4	15	C'	253	20 LBS.	O	6-6-60	9-17-60	10-26-60	14	5	20 — 2	NO ORBIT	"D" TIMER MALFUNCTION - AGENA FAILED TO ORBIT
XVII	1062	507 4	17	C'	297	39 LBS.	1.7 LEADER	9-12-60	10-17-60	11-20-60	5	0	9 — 6	11 — 22-60	SUCCESSFUL AIR CATCH - PAYLOAD BROKE T/M # 34
XVIII	1103	508 4	19	C'	296	39 LBS.	39 LBS	10-9-60	10-29-60	12-7-60	2	6	8 — 3	12-10-60	SUCCESSFUL AIR CATCH INSTRUMENT OPERATION O.K. T/M # 37
XIX	1101	N/A 2	N/A	N/A	258		O			12-20-60					NO SRV INSTALLED - (RM-1 PAYLOAD)
XX	1104	520 5	3	A	298	39 LBS.	39 LBS.	10-18-60	12-21-60	2-17-61	9	4	17 — 3		ORBITAL PROGRAMMER FAILED AT REV. (31) INSTRUMENT FAILED - STILL IN SPACE - NO SHUTTER FIRINGS
XXI	1102	N/A 2	N/A	N/A	261		O			2-18-61					NO SRV INSTALLED - (RM-2 PAYLOAD)
XXII	1105	509 4	18	C'	300	39 LBS.	O	2-21-61	3-28-61	3-30-61	5	0	5 — 2	NO ORBIT	AGENA FAILURE - NO ORBIT T/M # 39
XXIII	1106	521 5	4	A	307	39 LBS.	39 LBS	11-30-60	3-16-61	4-8-61	15	2	18 — 4		RECOVERY WAS ATTEMPTED ON REV. (31) DUE TO LOSS OF CONTROL GAS - STILL IN SPACE - INSTRUMENT OPERATION O.K.
XXIV	1108	541 5	8	A	302	39 LBS.	O	4-3-61	5-25-61	6-8-61	7	3	9 — 3	NO ORBIT	AGENA FAILURE - POWER FAILURE AND GUIDANCE PROBLEM CAUSING OCEAN IMPACT
XXV	1107	510 4	16	C'	309	39 LBS.	39 LBS	3-7-61	4-17-61	6-16-61	5	6	14 — 3	6-18-61	SUCCESSFUL WATER PICK-UP T/M # 37
XXVI	1109	511 4	20	C'	308	39 LBS.	28.78 LBS.	10-18-61 2-21-61	2-14-61 5-15-61	7-7-61	16 — 0 12 — 6	1 — 0 7 — 4	7-9-61		SUCCESSFUL AIR CATCH INSTRUMENT FAILED ON REV. (22) T/M # 43
XXVII	1110	524 5	7	A	322	39 LBS.	O	4-4-61	6-24-61	7-21-61	11 — 4	15 — 3	NO ORBIT		NO ORBIT - THOR GUIDANCE DESTRUCT
XXVIII	1111	512 4	21	C'	309	39 LBS.	O	11-13-60 4-17-61	3-4-61 5-20-61	8-2-61	16 — 0 4 — 5	6 — 2 10 — 5	NO ORBIT		AGENA GUIDANCE FAILURE T/M # 46
XXIX	1112	554 4	54	C'''	323	39 LBS.	39 LBS.	6-23-61	8-17-61	8-30-61	7 — 6	9 — 5	9-1-61		RECOVERY ON REV. (32) INSTRUMENT O.K. T/M # 42
XXX	1113	551	53	C'''	310	39 LBS	39 LBS	5-29-61	7-17-61	9-12-61	7 — 0	15 — 0	9-14-61		SUCCESSFUL AIR CATCH RECOVERY ON REV. (33) T/M # 49
XXXI	1114	552	55	C'''	324	39 LBS.	20 LBS	5-22-61	8-23-61	9-16-61	13 — 2	16 — 6	NO SEPARATION		SUCCESSFUL ORBIT - POWER FAILURE BEFOR RECOVERY PRECLUDED THE EVENT - INSTRUMENT O.K. 400 CYCLE FAILURE
XXXII	1115	555	56	C'''	328	39 LBS	12.4 LBS.	8-9-61	9-14-61	10-13-61	5 — 1	9 — 2	10-14-61		SUCCESSFUL AIR CATCH - SUSPECT AGENA POWER PROBLEMS — HAD TO ATTEMPT RECOVERY ON REV. (18) T/M # 52
XXXIII	1116	513	22	C'	329	39.5 LBS.	O	3-16-61	7-20-61	10-23-61	19 — 0	31 — 4	NO ORBIT		SECOND STAGE (AGENA) FAILED WENT INTO SEA AFTER TAKE OFF T/M # 37
XXXIV	1117	553	24	C'	330	39.0 LBS	39 LBS	5-22-61	9-26-61	11-5-61	18 - 2	24 - 0			SUCCESSFUL ORBIT - DUE TO GAS VALVE FAILURE NO RECOVERY STILL IN SPACE - INSTRUMENT OPERATION O.K. T/M # 51
XXXV	1118	523 B	25	C'	326	39.0 LBS	13 LBS	8-30-61	10-18-61	11-15-61	11 — 0	11 — 1	11-16-61		1 DAY OPERATION DUE TO SHORTAGE CONTROL GAS T/M # 44 INSTRUMENT OPERATION O.K. RECOVERY BUCKET RE USED AGAIN
XXXVI	1119	525 B	52	C'''	325	38.2 LBS	38.2 LBS	11-10-61	11-27-61	12-12-61	2 — 3	4 — 4	12-16-61		SUCCESSFUL ORBIT. RECOVERED ON 64TH REV. SUCCESSFUL WATER PICK UP INSTRUMENT OPERATION O.K. T/M # 50
XXXVII	1120	571	57	C'''	327	38.6 LBS	O	11-16-61.	12-19-61	1-13-62	4-5	3 — 3	NO ORBIT		AGENA FAILURE — NO ORBIT T/M # 42
XXXVIII	1123	581	70 & 71	C/M-1	241	37.6 & 37.5	75.1 LBS	1-3-62	2-16-62	2-27-62	6 — 2	7 — 6	3-3-62		SUCCESSFUL ORBIT & RECOVERED ON 65TH REV. ABLATIVE SHIELD RECOVERED MTHT, AIR SNATCHED, INSTRUMENT O.K. F.C. # 79 FAILED FULL SIGNAL OF MALFUNCTION T/M # 47
XXXIX	1124	584	72 & 73	C/M-2	331	38.4 & 37.8	45 LBS	1-5-62	4-5-62	4-17-62	12 — 6	14 — 4	4-20-62		SUCCESSFUL ORBIT & RECOVERED ON 33RD REV. AIR CATCH INSTRUMENT OK. GUIDANCE SYSTEM OPERATION O.K. T/M # 53
XXXX	1125	586	74 & 75	C/M-3	333	39.1 & 39.1	68.8 LBS	1-26-62	4-11-62	4-28-62	6 — 2	8 — 5			SUCCESSFUL ORBIT - OPERATIONAL MALFUNCTION ON ORBITAL TIMER BETWEEN 2ND & 13TH REV. TRIED TO RECOVER ON 64TH REV. BUT FAILED TO EJECT CHUTE. PARACHUTE EJECTION SQUIBS FAILED TO FIRE. SUNK ON IMPACT T/M # 56

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PROGRAM FLT Nº	VEH. Nº	SRV Nº	INSTR TYPE	INSTR Nº	THOR Nº	T/M Nº	DRCG Nº	S.I. Nº	PAY'D WT. FLOWN	PAY'D WT. TRANSF	REC INSPECT AT A/P	SHIPPED FROM A/P	FLIGHT DATE	WKS AT A/P	DAYS AT A/P	TOTAL WEEKS TILL FLT.	RECOVERED DATE	SUMMARY
XXXVIII	1123	581	Cm-1	70 / 71	241	57	7	74	37.6 / 37.5	75.1 LBS	1-3-62	2-16-62	2-27-62	6 - 2		7 - 6	3-3-62	SUCCESSFUL ORBIT AND RECOVERED ON 61ST REV. ABLATIVE SHIELD RECOVERED INTACT. AIR SNATCHED. INSTR. O.K. F.C. #74 FAILED. FULL SPOOLS OF PAYLOAD. T/M #57
XXXIX	1124	584	Cm-2	72 / 73	331	53	1	NONE	38.4 / 37.8	45 LBS	1-5-62	4-5-62	4-17-62	12 - 6		14 - 4	4-20-62	SUCCESSFUL ORBIT AND RECOVERED ON 33RD REV. AIR CATCH. INSTRUMENT O.K. GUIDANCE SYSTEM OPERATION O.K. T/M #53
XXXX	1125	586	Cm-3	74 / 75	333	52	6	70	39.1 / 39.1	68.8 LBS	1-26-62	4-11-62	4-28-62	10 - 5		13 - 1		SUCCESSFUL ORBIT - OPERATIONAL MALFUNCTION ON ORBITAL TIMER - BETWEEN 29TH & 30TH REV. TRIED TO RECOVER ON 64TH REV. BUT FAILED TO EJECT CHUTE. PARACHUTE EJECTOR SQUIBS FAILED TO FIRE SNARK - NO CANTAL. T/M #52
XXXXI	1126	582	A-5	A	334	58	13	N/A	39.4	39.4	5-26-61	4-25-62	5-15-62	47 - 4		50 - 3	5-19-62	SUCCESSFUL AIR RECOVERY ON 63RD REV. BELLOWS MISSING. M-TIMER MALFUNCTION. SHUTTER TIMER MALFUNCTION. INSTRUMENT OPERATION O.K. WITH THIS EXCEPTION.
XLII	1128	585	Cm-4	76 / 77	336	55	9	82	39.7 / 39.5	79.2	2-16-62	5-13-62	5-29-62	12 - 2		14 - 4	6-1-62	SUCCESSFUL AIR RECOVERY ON 49TH REV. NO F/C OPERATION. PARACHUTE STRAP BURNED OFF. CAPSULE 200 MILES OUT OF BAIL PARK DUE TO COMMAND DUMP SEQUENCE.
XLIII	1127	583	Cm-5	78 / 79	335	44	8	76	40.6 / 40.5	81.1	3-1-62	5-21-62	6-1-62	11 - 4		13 - 1		SUCCESSFUL ORBIT. TRIED TO AIR SNATCH / CHUTE TORE LOOSE. BUCKET WENT INTO OCEAN. STAYED AFLOAT FOR 3 MINUTES THEN SANK: INSTRUMENT OPERATION O.K.
XLIV	1129	591	Cm-6	80 / 81	339	48	10	88	40.1 / 40.2	80.3	3-21-62	5-30-62	6-22-62	10 - 0		13 - 2	6-25-62	SUCCESSFUL AIR RECOVERY. RECOVERED ON 50TH REV. CHUTE CORD INTACT. AIR SNATCH AT 12000 FEET. ON FIRST PASS. NO KNOWN MALFUNCTIONS. F/C #88. FULL SPOOL.
XLV	1151	592	Cm-7	84 / 85	340	50	3	80	40.1 / 39.9	80	3-20-62	6-13-62	6-28-62	12 - 1		14 - 2	7-1-62	SUCCESSFUL AIR CATCH ON 63RD REV. FIRST AGENA D / AGENA BURNED TO FUEL DEPLETION CAUSING (3) MINUTES HIGH ON PERIOD. F/C #80 DID NOT WORK. MINOR DISCREPANCY TO SYSTEM. INSTR. OPERATION O.K.
XLVI	1130	593	Cm-8	90 / 91	342	59	13	90	40.2 / 40.2	19.7	4-11-62	6-20-62	7-20-62	10 - 0		14 - 2	7-22-62	SUCCESSFUL AIR RECOVERY. RECOVERED THROUGH NORMAL ROUTINE SEQUENCE AFTER ONLY 33 REV. (2) DAY ORBIT. F/C #90 FULL. M-TIMER MALFUNCTION. INSTRUMENT OPERATION ONLY 14%
XLVII	1131	594	Cm-9	82 / 83	347	56	16	86	39.4 / 39.3	78.7	4-19-62	7-3-62	7-27-62	10 - 5		14 - 1	7-31-62	SUCCESSFUL AIR RECOVERY. NORMAL RECOVERY SEQUENCE OPERATION. RECOVERED ON 57TH REV. INSTRUMENTATION O.K. F/C #96 FAILED. DUE POSSIBLY TO METERING SWITCH / SOLENOID QUITTING
XLVIII	1152D	595	Cm-10	88 / 89	344	60	5	94	39.5 / 39.4	78.9	4-30-62	7-17-62	8-1-62	11 - 1		13 - 2	8-5-62	SUCCESSFUL AIR RECOVERY. RECOVERED THROUGH NORMAL SEQUENCE AFTER 65TH REV. INSTRUMENT OPERATION O.K. F/C #94 FULL.
IL	1153	596	Cm-11	92 / 93	348	58	19	84	39.4 / 39.3	78.7	5-19-62	8-24-62	8-28-62	13 - 6		14 - 3	9-1-62	SUCCESSFUL AIR RECOVERY. RECOVERED THROUGH NORMAL SEQUENCE AFTER 65TH REV. INSTRUMENT OPERATION O.K. F/C #89 DIDNT FUNCTION PROPERLY.
L	1132	600	A-10	A	349	63	202	N/A	36.3	36.3	6-22-62	8-6-62	9-1-62	6 - 3		10 - 1		SUCCESSFUL INSTRUMENT OPERATION / PLANNED TO RECOVER AFTER 65TH REV. BUT CHUTE TORE FROM BUCKET DURING AIR PICK-UP. NO F/C FLOWN.
LI	1133	597	Cm-12	94 / 95	350	65	4	100	40.2 / 40.2	44.2	5-16-62	9-1-62	9-17-62	15 - 3		17 - 5	9-18-62	SUCCESSFUL AIR RECOVERY ON 173RD REV. NOTHING ON F/C #87/100. BROUGHT BACK EARLY BECAUSE OF 100 MILE PERIGEE AND RADIATION FACTOR INVOLVED. INSTRUMENT OPERATION O.K.
LII	1154D	598	Cm-13	96 / 97	351	64	11	D-3	39.6 / 39.5	66	6-20-62	9-13-62	9-29-62	12 - 1		14 - 3	10-2-62	SUCCESSFUL AIR RECOVERY ON 43RD REV. F/C #85 OPERATIONAL THROUGH REV. #3 / BROUGHT BACK FULL. WATER SEAL ON MAIN INSTRUMENT SIDE FAILED TO CLOSE / WINDY CUT PAYLOAD. PART OF PAYLOAD STILL IN W/S.
LIII	1134	603	A-9	A	352	66	10	N/A	38.3	38.3	3-31-62	9-30-62	10-9-62	26 - 1		27 - 3	10-13-62	SUCCESSFUL AIR RECOVERY ON 65TH REV. THIS VEHICLE WAS 70 MILES OUT AT APOGEE. IT WAS INTENDED FOR 170 MILES OUT BUT WENT 242 MILES OUT. SHUTTER TIMER MALFUNCTION.
LIV	11368	599	Cm-14	98 / 99	367	54	24	D-5	39.8 / 39.6	79.4	6-25-62	10-23-62	11-5-62	17 - 1		19 - 0	11-9-62	SUCCESSFUL AIR RECOVERY ON 65TH REV. F/C #85 FULL. INSTRUMENT OPERATION PERFECT.
LV	1135	601	Cm-15	100 / 101	353	62	23	D-7	39.4 / 39.4	78.8	7-10-62	11-12-62	11-24-62	17 - 6		19 - 4	11-29-62	
LVI	1155	606	Cm-16	86 / 87	361	56	17	D-2	39.6 / 39.9	67	9-19-62	11-24-62	12-4-62	9 - 3		10 - 6		SUCCESSFUL AIR RECOVERY ON 81ST REV. F/C #87/179 DIDN'T OPERATE. INSTRUMENT OPERATION O.K. DRCG #23 PICKED UP CAPSULE 32 MILES FROM HONOLULU.
LVII	1156	607	Cm-17	102 / 103	368	70	18	D-4	39.7 / 39.6	79.3	8-13-62	12-7-62	12-14-62	16 - 4		17 - 4	12-18-62	SUCCESSFUL ORBIT. DURING AIR SNATCH OPERATION 583 HOOK TORE OUT PART OF CHUTE CAUSING BUCKET TO GO INTO DAVY JONES LOCKER. DRCG #19. F/C #86/6/6 - ONLY (2) DAY ORBIT DUE TO 80 MILE PERIGEE.
LVIII	1157	608	Cm-18	104 / 105	369	69	21	D-8	39.1 / 39.0	78.1	10-23-62	12-20-62	1-7-63	8 - 2		10 - 6	1-11-63	SUCCESSFUL AIR RECOVERY ON 64TH REV. S.I. UNIT FULL. INSTR. OPERATION O.K.
LIX	1159	610	Cm-20	108 / 109	370	67	12	D-6	39.3 / 39.5	O	12-8-62	2-13-63	3-4-63	9 - 3		12 - 1		SUCCESSFUL WATER PICK-UP AFTER 64 REVOLUTIONS. INSTRUMENT OPERATION O.K.
LX	1164	612	L-1	3	360	70	303	S-2	72.2	O	11-27-62	3-5-63	3-18-63	14 - 0		15 - 6		FIRST TAT - 3RD TAT BOOSTER FAILED TO SEPERATE. DESTRUCTED 20 SECONDS AFTER LAUNCH
LXI	1160	609	Cm-19	106 / 107	376	60	22	D-10	38.8 / 38.8	66.7	9-21-62	2-25-63	4-1-63	22 - 3		27 - 2	4-4-63	SECOND TAT - WORKED PERFECT - NO ORBIT DUE TO FAILURE OF PNEUMATIC GUIDANCE ON AGENA BOOSTER
LXII	1411	605	A-12	A	372	54	205	N/A	38.3	O	1-10-63	4-10-63	4-26-63	12 - 6		15 - 1		SUCCESSFUL AIR RECOVERY. HAD TO RECOVER AFTER 49 REVOLUTIONS BECAUSE OF AGENA POWER SUPPLY PROBLEM (400 CYCLE INVERTER FAILED) INSTRUMENT OPERATION PERFECT
LXIII	1165	613	L-2	05	364	58	302	S3	72.9	O	2-26-63	4-19-63	5-18-63	6 - 5		11 - 4	5-21-63	NO ORBIT ACHEIVED - ATTITUDE SENSORS MISALIGNED - PERFECT LAUNCH
LXIV	1161	616	M-21	112 / 113	362	68	26	D9	39.5 / 39.2	78.7	12-7-62	4-13-63	6-12-63	18 - 1		26 - 5	6-16-63	ON DECODER S/N 103 NO ACTIVATE SIGNAL (BOOST LINE SHORT) ERATIC ORBIT - AGENA BOOST TOO STRONG - D TIMER 4 SECONDS SLOW - RECOVERED AFTER 33 ORBITS
LXV	1166	611	M-22	110 / 111	381	62	20	D11	39.6 / 39.4	78.9	4-15-63	6-1-63	6-26-63	6-5		10 - 2	6-30-63	SUCCESSFUL AIR RECOVERY OPERATION AFTER 65 REVOLUTIONS. FIRST "P" INSTRUMENT FLOWN & INSTRUMENT OPERATION O.K.
LXVI	1412	624	M-23	120 / 121	388	55	14	D12	39.1 / 39.1	78.2	5-1-63	6-16-63	7-18-63	6 - 4		11 - 2	7-22-63	"P" DOOR FAILED TO EJECT. INSTRUMENT OPERATION O.K.
LXVII	1167	614	L-3	01	382	66	304	D-4	79.1	19.8	3-7-63	7-8-63	7-30-63	17 - 4		20 - 5	8-1-63	"SUCCESSFUL AIR RECOVERY AFTER 64 REVOLUTIONS (9 DAYS) LOST CENTER FORMAT CLOSURE ON SLAVE UNIT (SOME LOSS OF T/M SERIAL TIME WORD & CYCLE COUNTER) TEMPERATURE IN ORBIT WAS IN MID 80'S
LXVIII	1162	615	J-1A	114 / 115	377	65	402	D-14	81.5	81.5	4-1-63	8-3-63	8-24-63	17 - 5		20 - 5	8-28-63	SUCCESSFUL AIR RECOVERY. RECOVERED ON 63RD REV. BELLOWS MISSING. M-TIMER MALFUNCTION. INSTRUMENT OPERATION ONLY THROUGH THE 23RD REV. INSTRUMENT MALFUNCTION
	1162	617	J-1B	114 / 115	377	01	402	D-16	81.5		4-1-63	8-3-63	8-24-63	17-5		20-5		SUCCESSFUL AIR RECOVERY AFTER 64 REVOLUTIONS (4) DAYS S/E FAILURE FIRST "J" SYSTEM FLOWN MAIN INSTRUMENT OPERATION O.K.
LXVIX	1169	604	A-11	A	394	64	203	N/A	38.9	38.9	9-3-62	8-2-63	8-29-63	47-5		51-4	9-2-63	TRIED TO RECOVER AFTER 12 DAYS - 400 CYCLE INVERTER ON AGENA FAILED - S/E INTERMITTEN TEMP SENSORS SHOWED VEHICLE RUNNING HOT
LXX	1163	619	J-2A	116 / 117	383	69	404	D-18	81.7	81	4-24-63	8-27-63	9-23-63	17 - 6		21 - 5	9-26-63	SUCCESSFUL AIR RECOVERY. RECOVERED ON 66TH REV. INSTRUMENT OPERATION PERFECT
	1163	620	J-2B	116 / 117	383	60	404	D-13	82.5		4-24-63	8-27-63	9-23-63	17 - 6		21 - 5		SUCCESSFUL AIR RECOVERY AFTER 49 REVOLUTIONS (3 DAYS) MASTER UNIT ON THE CASSETTE FAILED DUE TO MISADJUSTMENT ON PUCK ARM - PAYLOAD AND CONSISTANT LIGHT LEAKS. HANDLE RIVIT FAILURE
LXXI	1601	602	A-6	A	386	50	204	N/A	40.1	40.1	2-21-61	10-8-63	10-29-63	136 - 6		139 - 6	11-3-63	TRIED TO RECOVER ON 166 REVOLUTIONS BUT COMMANDS FAILED. DECODER FAILURE IN VEHICLE
LXXII	1171	632	M-24	128 / 129	400	48	504	D27	78.7	O	8-10-63	10-30-63	11-9-63	11 - 4		13 - 0		SUCCESSFUL AIR RECOVERY AFTER 65 REVOLUTIONS (4) DAYS PERFECT INSTRUMENT OPERATION BEST "A" SYSTEM FLOWN TO DATE. THREE TIME DISCONTINUITIES ON DRCG # 204 SYSTEM BECAME UNSTABLE 90 SECONDS AFTER LAUNCH - SHARK BAIT T/M CASSETTE # T-23 USED

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MISSION NBR	PAYLOAD NBR	VEHICLE NBR	LAUNCH DATE
	C	1023	25 Jun 59
	C	1029	13 Aug 59
	C	1028	19 Aug 59
	C	1051	7 Nov 59
	C	1050	20 Nov 59
9006	C	1052	4 Feb 60
9007	C	1054	19 Feb 60
9008	C	1055	15 Apr 60
9009	C	1056	18 Aug 60
9011	C'	1061	26 Oct 60
9010	C	1058	13 Sep 60
9012	C'	1062	20 Nov 60
9013	C'	1103	7 Dec 60
9014	A	1104	21 Dec 60
9015	C'	1105	30 Mar 61
9016A	A	1106	8 Apr 61
9018A	A	1108	8 Jun 61
9017	C'	1107	16 Jun 61
9019	C'	1109	7 Jul 61
9020A	A	1110	21 Jul 61
9021	C'	1111	2 Aug 61
9023	C'''	1112	30 Aug 61
9022	C'''	1113	12 Sep 61
9024	C'''	1114	16 Sep 61
9025	C'''	1115	13 Oct 61
9026	C'	1116	23 Oct 61
9027	C'	1117	5 Nov 61
9028	C'	1118	15 Nov 61
9029	C'''	1119	12 Dec 61
9030	C'''	1120	13 Jan 62
9031	C/M-1	1123	27 Feb 62
9032	C/M-2	1124	17 Apr 62
9033	C/M-3	1125	28 Apr 62
9034A	A-5	1126	15 May 62
9035	C/M-4	1128	29 May 62
9036	C/M-5	1127	1 Jun 62
9037	C/M-6	1129	22 Jun 62
9038	C/M-7	1151	28 Jun 62
9039	C/M-8	1130	20 Jul 62
9040	C/M-9	1131	27 Jul 62
9041	C/M-10	1152D	1 Aug 62
9044	C/M-11	1153	28 Aug 62
9042A	A-10	1132	1 Sep 62
9043	C/M-12	1133	17 Sep 62
9045	C/M-13	1154D	29 Sep 62
9046A	A-9	1134	9 Oct 62
9047	C/M-14	1136B	5 Nov 62
9048	C/M-15	1135	24 Nov 62
9049	C/M-16	1155	4 Dec 62
9050	C/M-17	1156	14 Dec 62
9051	C/M-18	1157	7 Jan 63
9052	C/M-20	1159	4 Mar 63
8001	L-1	1164	18 Mar 63
9053	C/M-19	1160	1 Apr 63
9055A	A-12	1411	26 Apr 63
8002	L-2	1165	18 May 63
9054	M-21	1161	12 Jun 63
9056	M-22	1166	26 Jun 63
9057	M-23	1412	18 Jul 63
8003	L-3	1167	30 Jul 63
1001	J-1 A&B	1169	24 Aug 63
9058A	A-11	1169	29 Aug 63
1002	J-2 A&B	1163	23 Sep 63
9059A	A-6	1601	29 Oct 63
9060	M-24	1171	9 Nov 63
9061	M-25	1172	27 Nov 63

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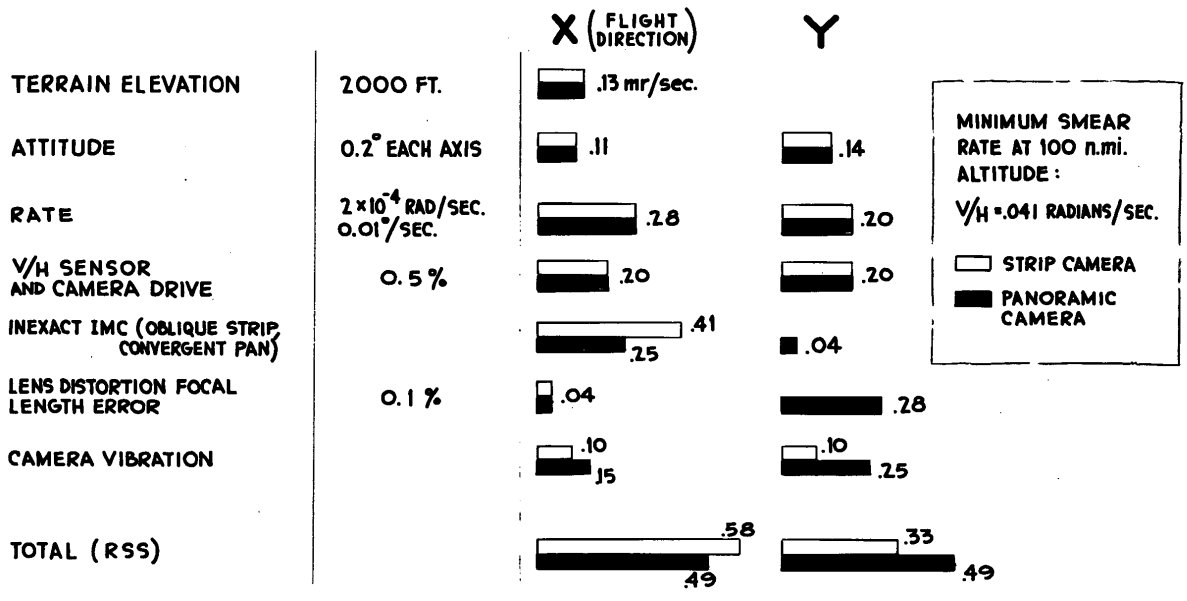
IDEAL CORRECTION OF SMEAR RATE



MEAN SMEAR RATE
FOR THIS IDEAL CASE
0.5 mr/sec. OR 1.2 % OF V/H

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ANGULAR AND GROUND RESOLUTION

FOR FIXED INPUT TO CAMERA LENS

FIX

LENS DIAMETER
- LIGHT ENERGY
- DIFFRACTION
- (LENS WEIGHT)

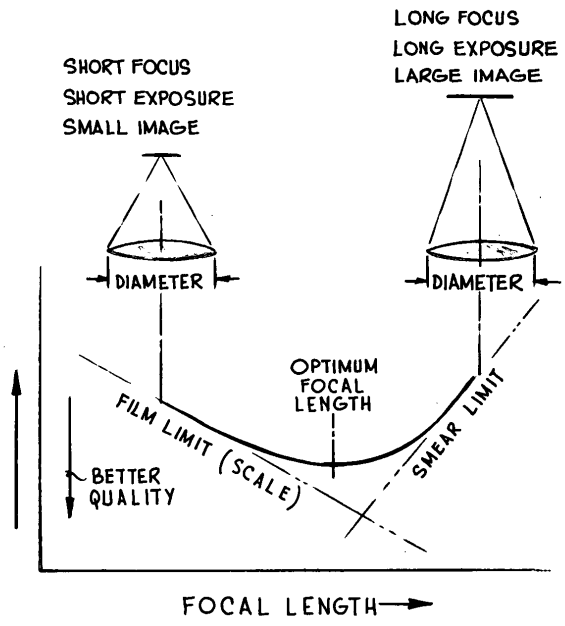
ANGULAR RATE OF SMEAR

FILM

VARY

FOCAL LENGTH AND f/NO.

EXPOSURE (TO MATCH FILM AND f/NO.)



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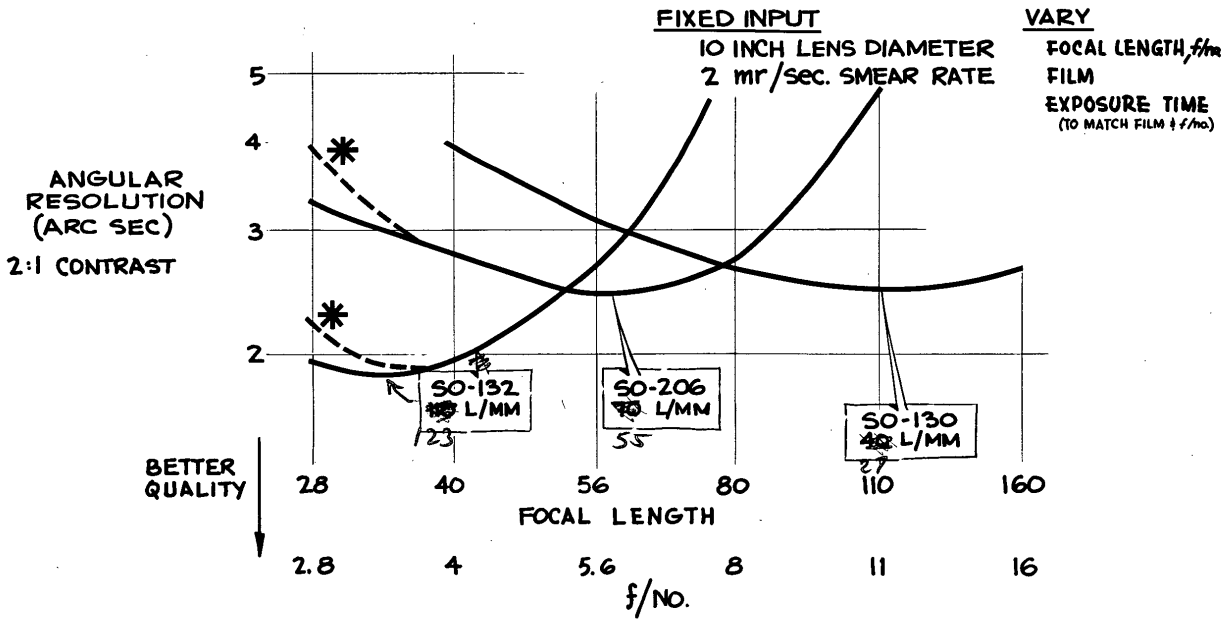
ANGULAR RESOLUTION vs. FOCAL LENGTH

FOR VARIOUS FILMS



* LOSS DUE TO ABERRATIONS OF VERY FAST LENSES.

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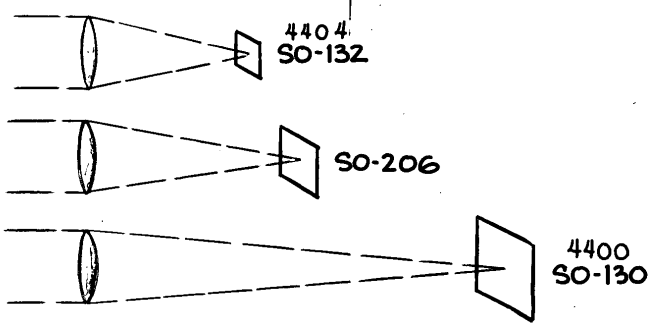
COMPARISON OF SYSTEMS USING DIFFERENT FILMS

FIXED LENS DIAMETER & SMEAR RATE

	4404 SO-132	SO-206	4400 SO-130
RELATIVE GROUND AND ANGULAR RESOLUTION	1.0	1.31	1.27
IMAGE RESOLUTION	123	55	27
OPTIMUM FOCAL LENGTH	35	60	125
OPTIMUM f/NO.	3.5	6	12.5
RELATIVE FILM WEIGHT	1	2.9	7.8
RADIATION SUSCEPTIBILITY	~1	~2	~10



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EFFECT OF IMAGE SMEAR

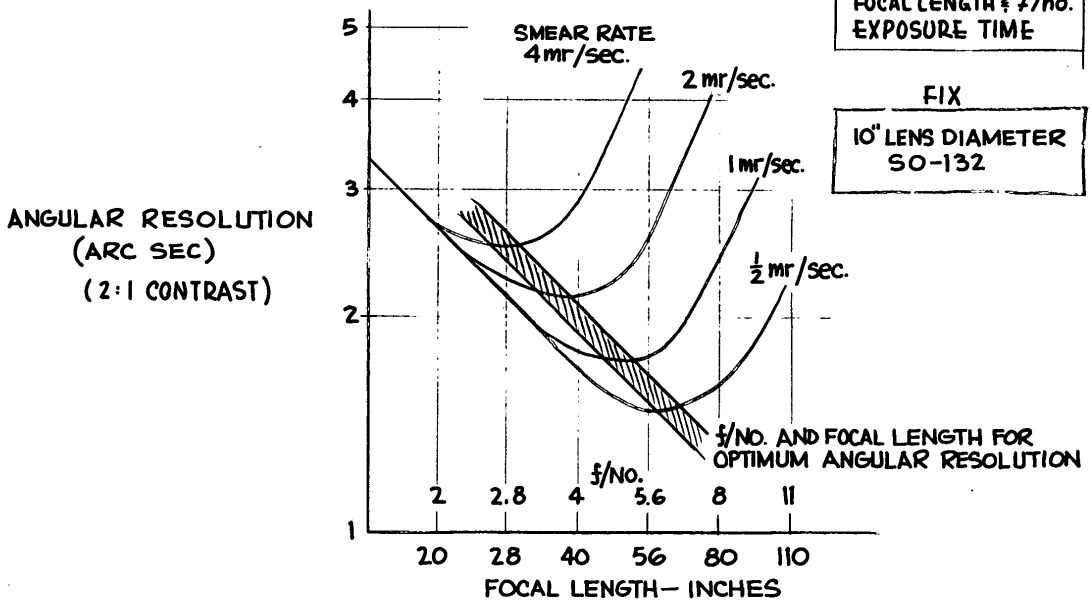
ANGULAR RESOLUTION VS. f/NO. AND FOCAL LENGTH

VARY

SMEAR RATE
FOCAL LENGTH & f/no.
EXPOSURE TIME

FIX

10" LENS DIAMETER
SO-132



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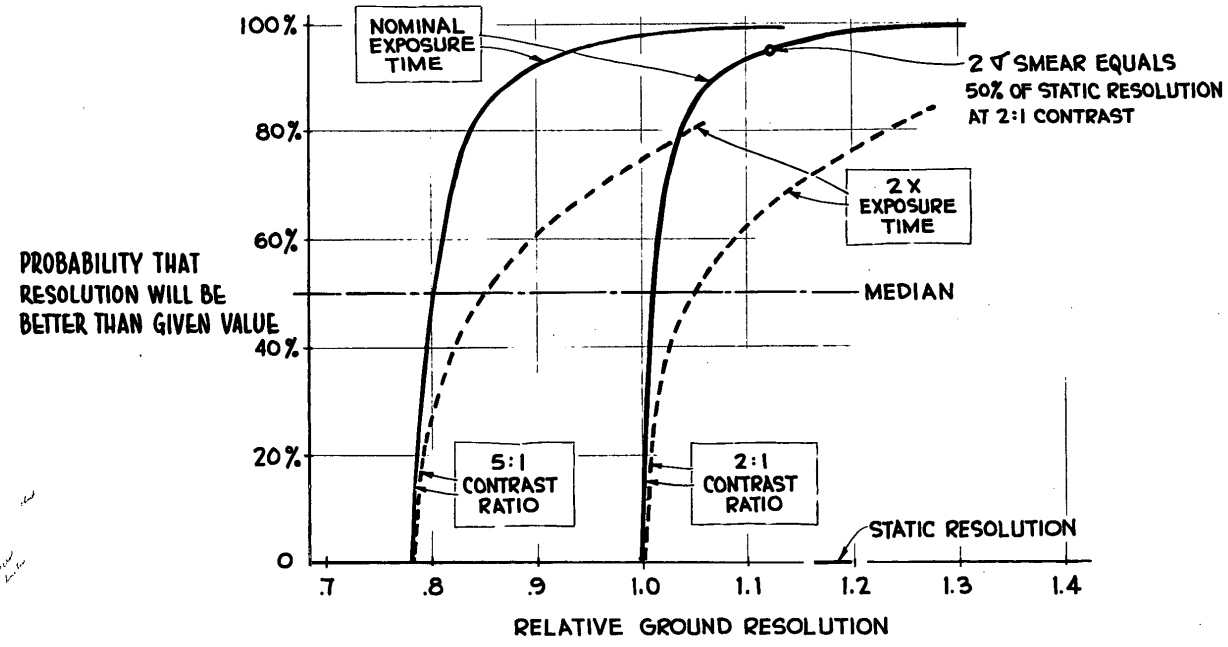
SPREAD OF RESOLUTION DUE TO IMAGE SMEAR



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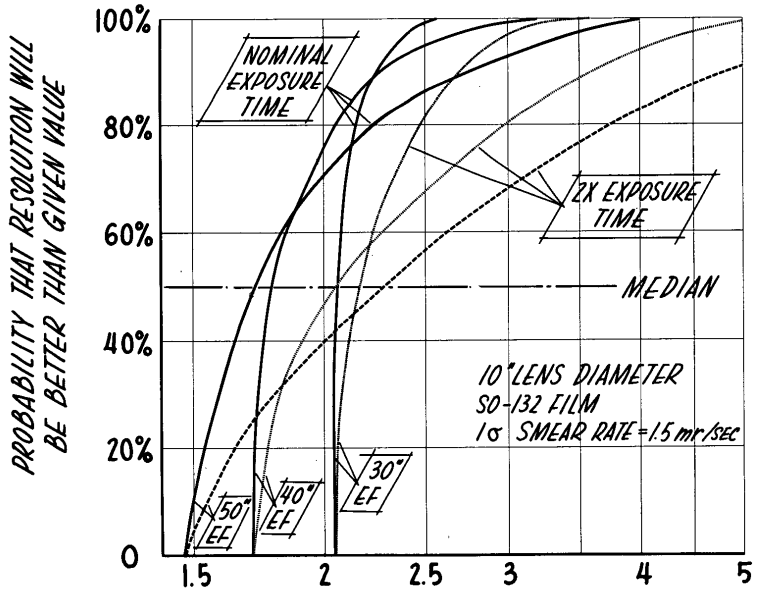
SECRET SPECIAL HANDLING

RESOLUTION SPREAD DUE TO SMEAR

FOR VARIOUS FOCAL LENGTHS



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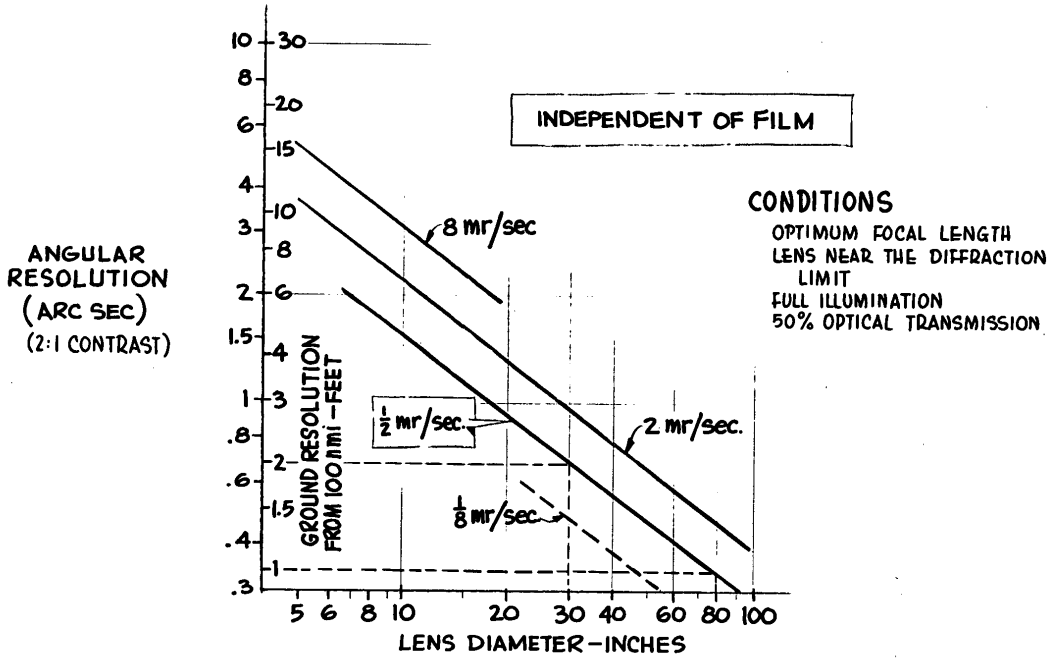
GROUND RESOLUTION VS. APERTURE

FOR A GIVEN SMEAR RATE



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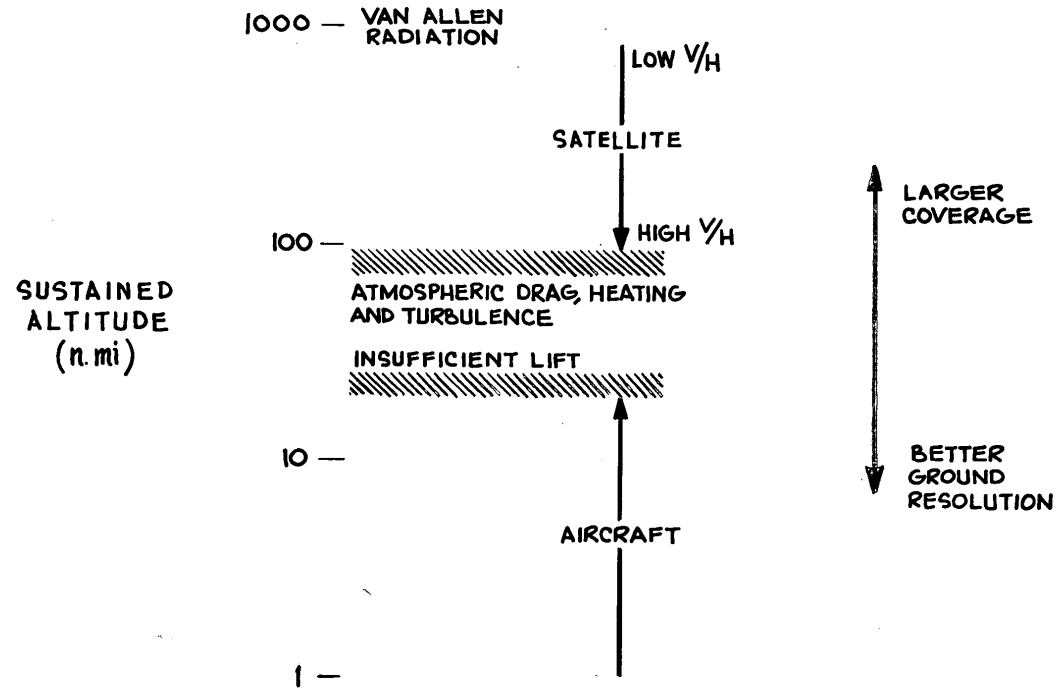
ALTITUDE



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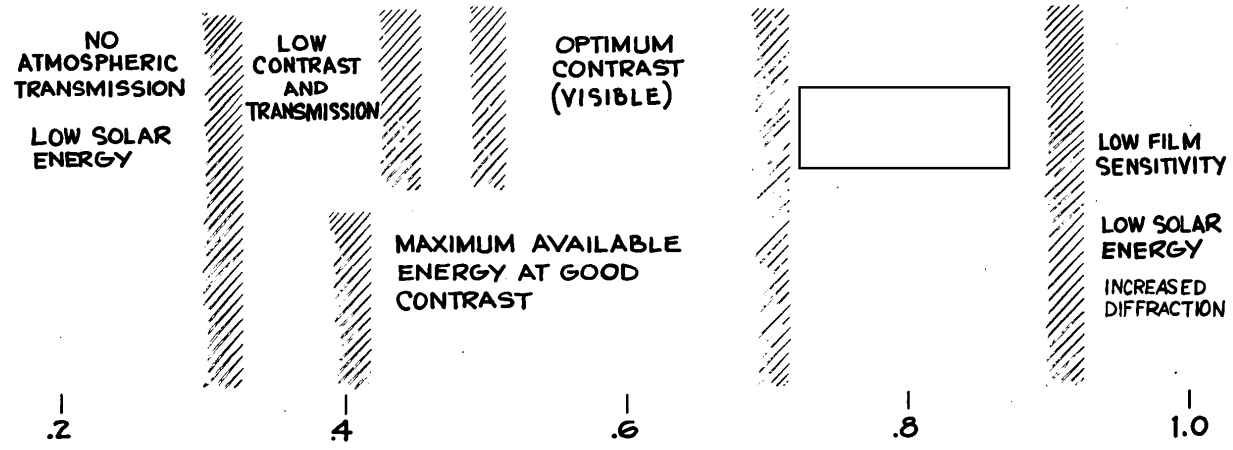
OPTIMUM SPECTRAL REGION FOR AERIAL PHOTOGRAPHY

CHOICE BASED ON

- SOLAR IRRADIANCE
- ATMOSPHERIC TRANSMISSION
- SCENE REFLECTANCE
- SCENE CONTRAST
- DIFFRACTION
- LENS TRANSMITTANCE AND COLOR CORRECTION
- FILM SPECTRAL SENSITIVITY



25X1

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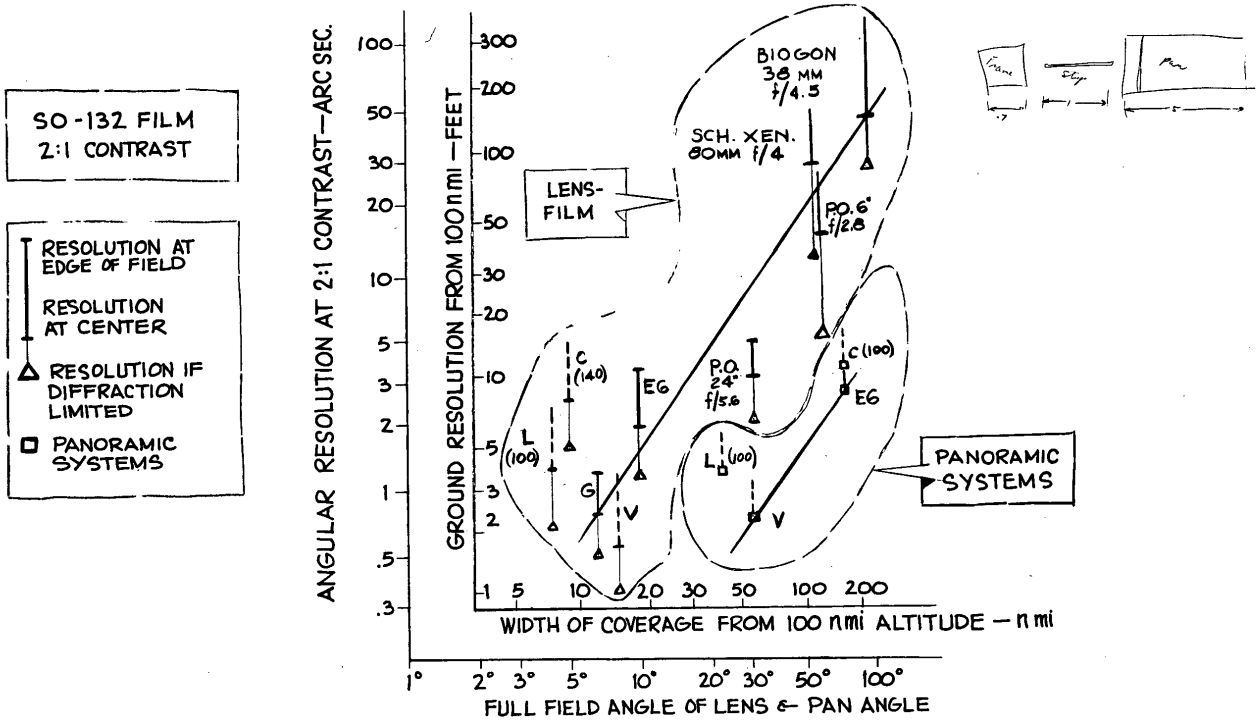
RESOLUTION vs. FIELD ANGLE



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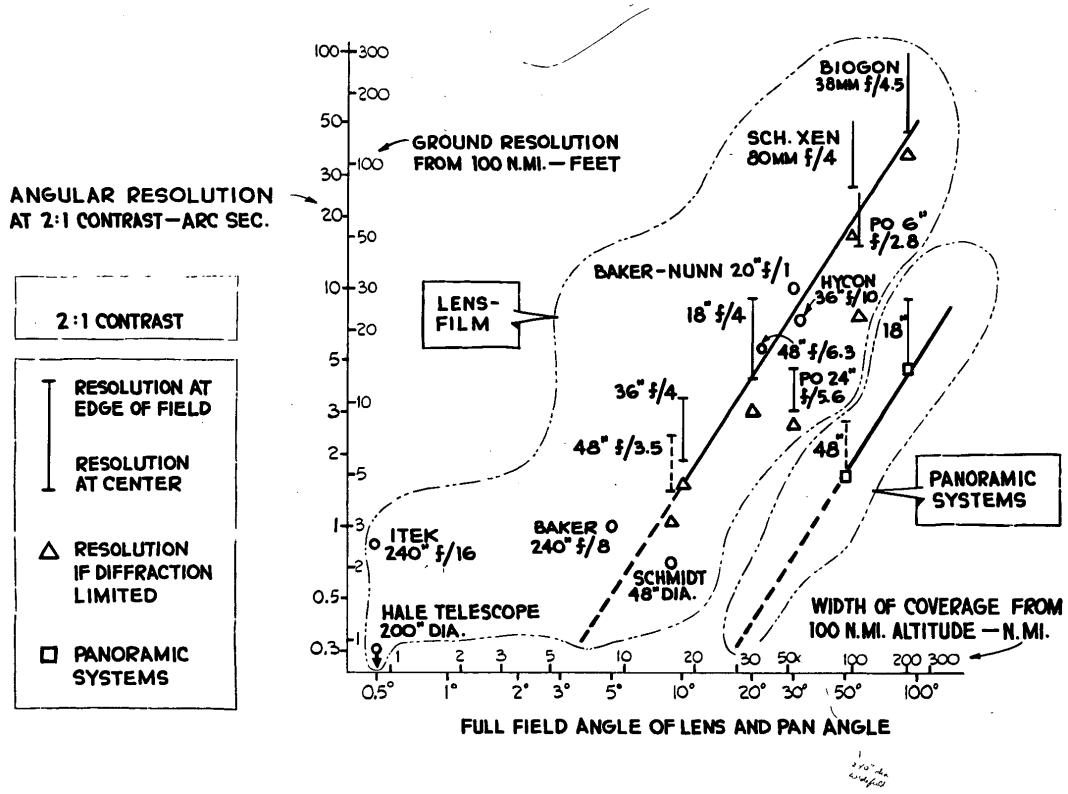
RESOLUTION vs. FIELD ANGLE



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GENERAL STUDY OF CAMERA SYSTEMS FOR PHOTOGRAPHIC AERIAL RECONNAISSANCE

PURPOSE

INVESTIGATE TRADE-OFFS AMONG THE MANY PARAMETERS.
OPTIMIZE THE PHOTOGRAPHIC OUTPUT.
DETERMINE THE REQUIRED CONDITIONS TO ATTAIN A SPECIFIED PERFORMANCE LEVEL.
PREDICT EFFORT WHICH WILL YIELD GREATEST ADVANCES.

PARAMETERS & CONDITIONS

CONTROLLED BY NATURAL LAWS

- SOLAR RADIATION
- ATMOSPHERIC TRANSMISSION & SCATTERING
- SCENE REFLECTANCE & CONTRAST
- DIFFRACTION OF LIGHT

SPECIFIED

- ALTITUDE } ANGULAR RESOLUTION
- GROUND RESOLUTION } ANGULAR RESOLUTION
- COVERAGE & MISSION LIFE
- VELOCITY
- WEIGHT LIMIT

VARIABLES [LIMITED BY STATE-OF-THE-ART]

SPECTRAL REGION

IMAGE SMEAR

- CAMERA SYSTEM
- VEHICLE ANGULAR MOTION & POSITION

LENS

- DIAMETER
- FIELD
- f/NO. AND FOCAL LENGTH
- IMAGE QUALITY

FILM

- SENSITIVITY
- IMAGE QUALITY

CAMERA TYPE

SECRET
SPECIAL HANDLING

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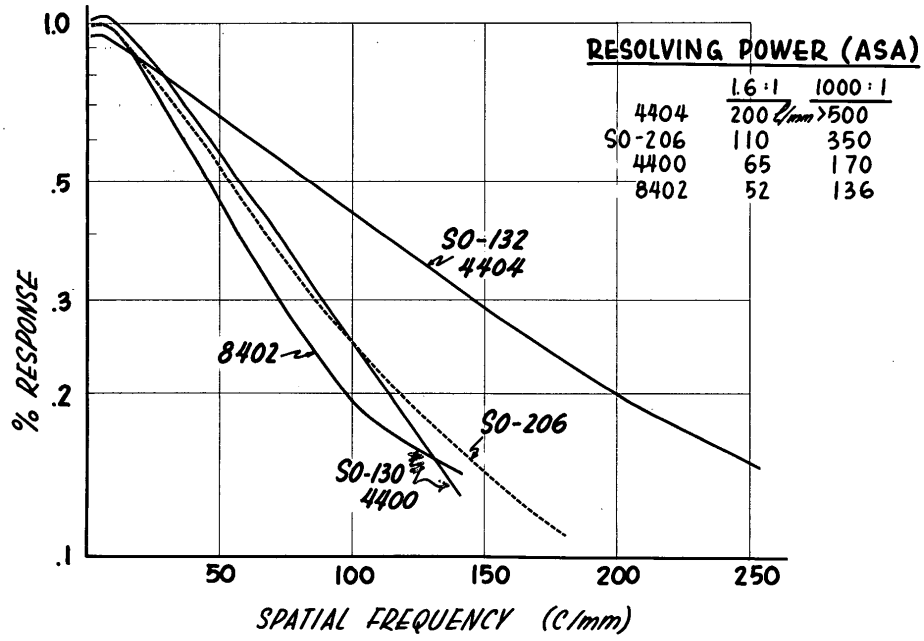
MODULATION TRANSFER FUNCTION and RESOLVING POWER



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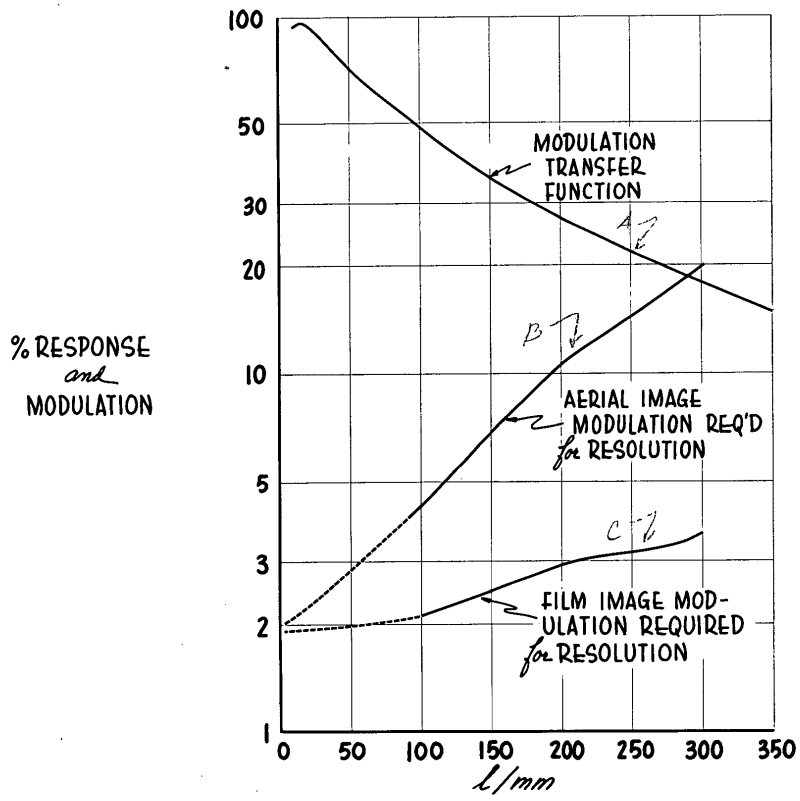
FILM IMAGE CHARACTERISTICS 4404



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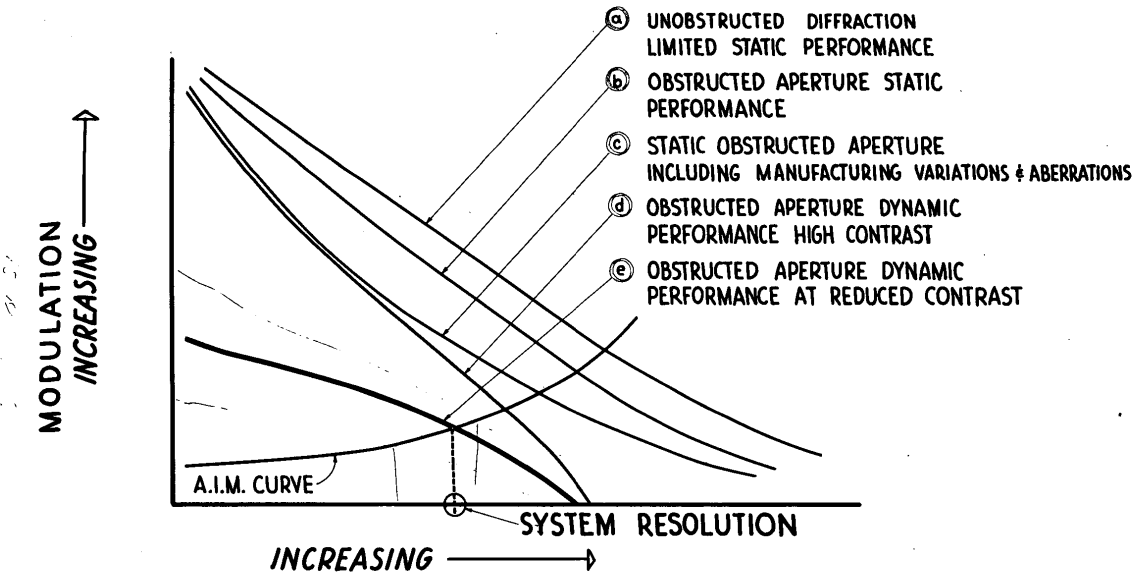
TYPICAL MTF & SYSTEM PERFORMANCE


ⓐ UNOBSTRUCTED DIFFRACTION LIMITED STATIC PERFORMANCE
ⓑ OBSTRUCTED APERTURE STATIC PERFORMANCE
ⓒ STATIC OBSTRUCTED APERTURE INCLUDING MANUFACTURING VARIATIONS & ABERRATIONS
ⓓ OBSTRUCTED APERTURE DYNAMIC PERFORMANCE HIGH CONTRAST
ⓔ OBSTRUCTED APERTURE DYNAMIC PERFORMANCE AT REDUCED CONTRAST
MODULATION INCREASING
A.I.M. CURVE
SYSTEM RESOLUTION
INCREASING
SPATIAL FREQUENCY (LINES/MM)

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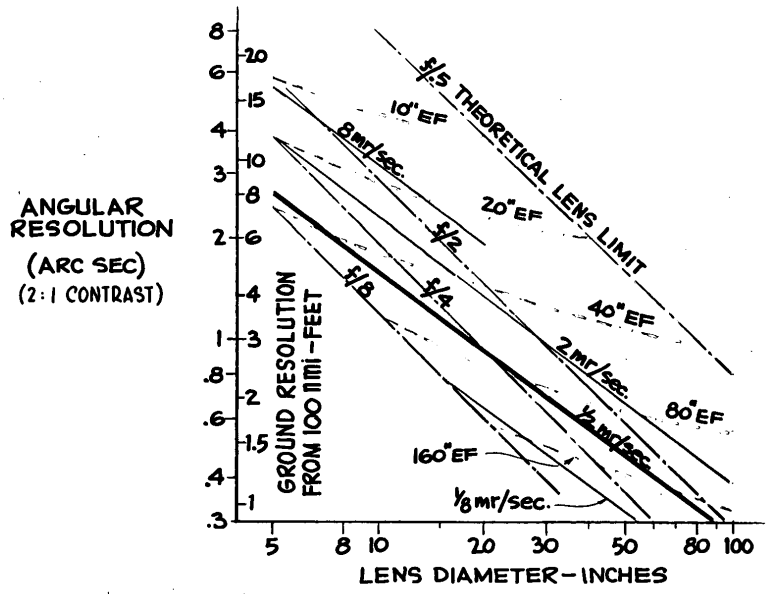
OPTIMUM DIAMETER, f/NO., FOCAL LENGTH

FOR A GIVEN RESOLUTION AND SMEAR RATE SO-132 FILM



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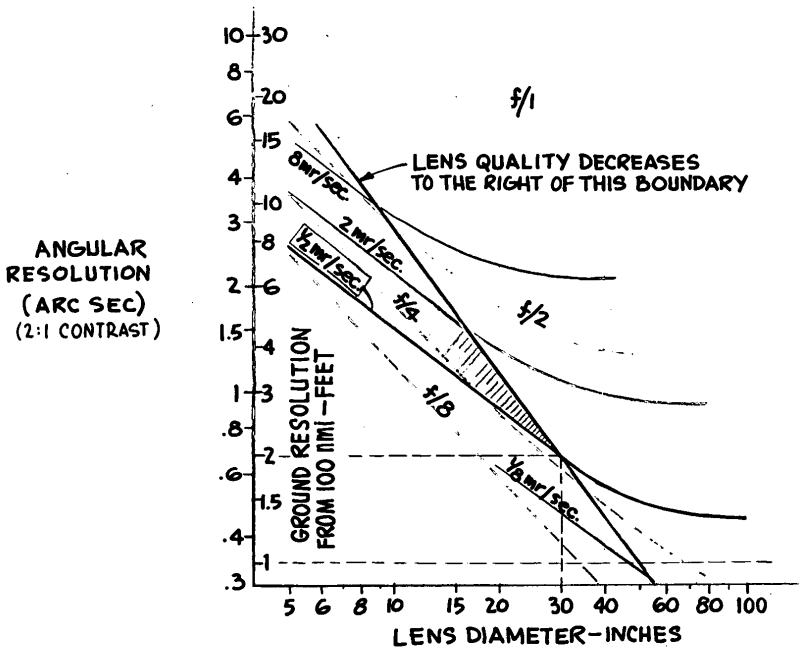
OPTIMUM DIAMETER AND f/NO.

FOR LENSES WITH EXPECTED ABERRATIONS SO-132 FILM


ANGULAR RESOLUTION (ARC SEC) (2:1 CONTRAST)
GROUND RESOLUTION FROM 100 NMI—FEET
LENS DIAMETER—INCHES
10 8 6 4 3 2 1.5 1 .8 .6 .4 .3
30 20 15 10 8 6 4 3 2 1.5 1
5 6 8 10 15 20 30 40 60 80 100
f/1
f/2
f/4
f/8
8 mr/sec.
2 mr/sec.
½ mr/sec.
⅛ mr/sec.
LENS QUALITY DECREASES TO THE RIGHT OF THIS BOUNDARY

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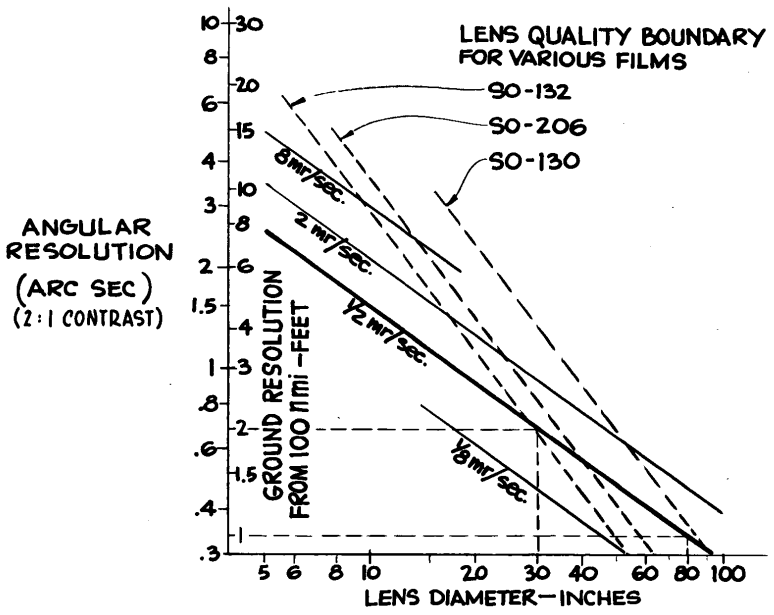
LIMITATION OF LENS QUALITY ON OPTIMUM DIAMETER


LENS QUALITY BOUNDARY FOR VARIOUS FILMS
90-132
SO-206
SO-130
8 mr/sec.
2 mr/sec.
½ mr/sec.
⅛ mr/sec.
ANGULAR RESOLUTION (ARC SEC) (2:1 CONTRAST)
GROUND RESOLUTION FROM 100 n mi - FEET
10 8 6 4 3 2 1.5 1 .8 .6 .4 .3
30 20 15 10 8 6 4 3 2 1.5 1
5 6 8 10 20 30 40 60 80 100
LENS DIAMETER—INCHES

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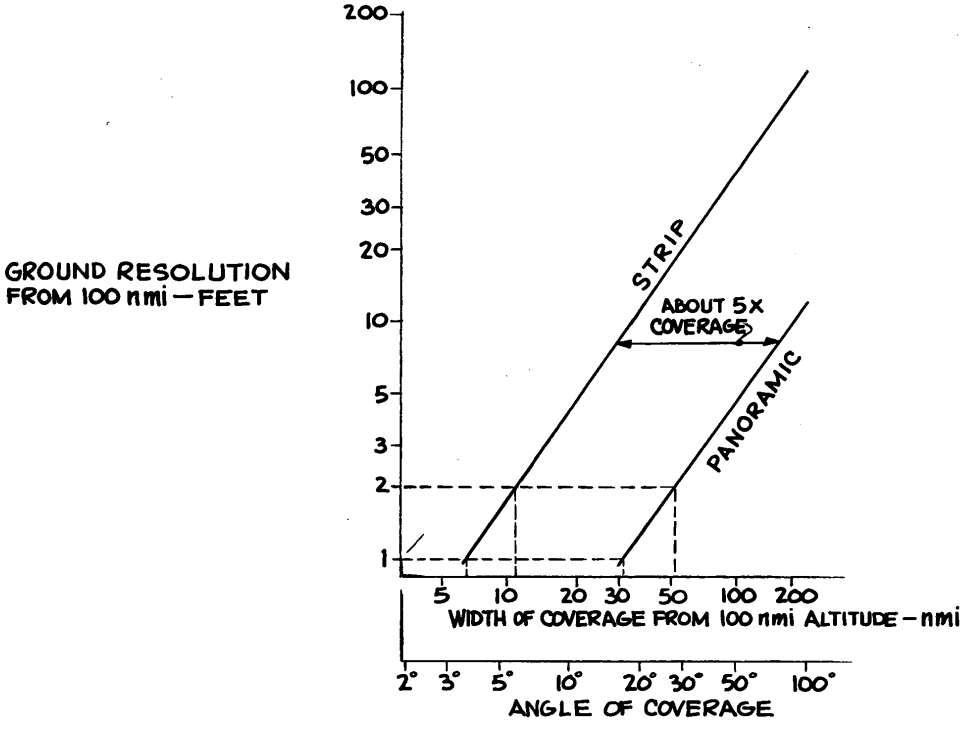
WIDTH OF GROUND COVERAGE vs. GROUND RESOLUTION



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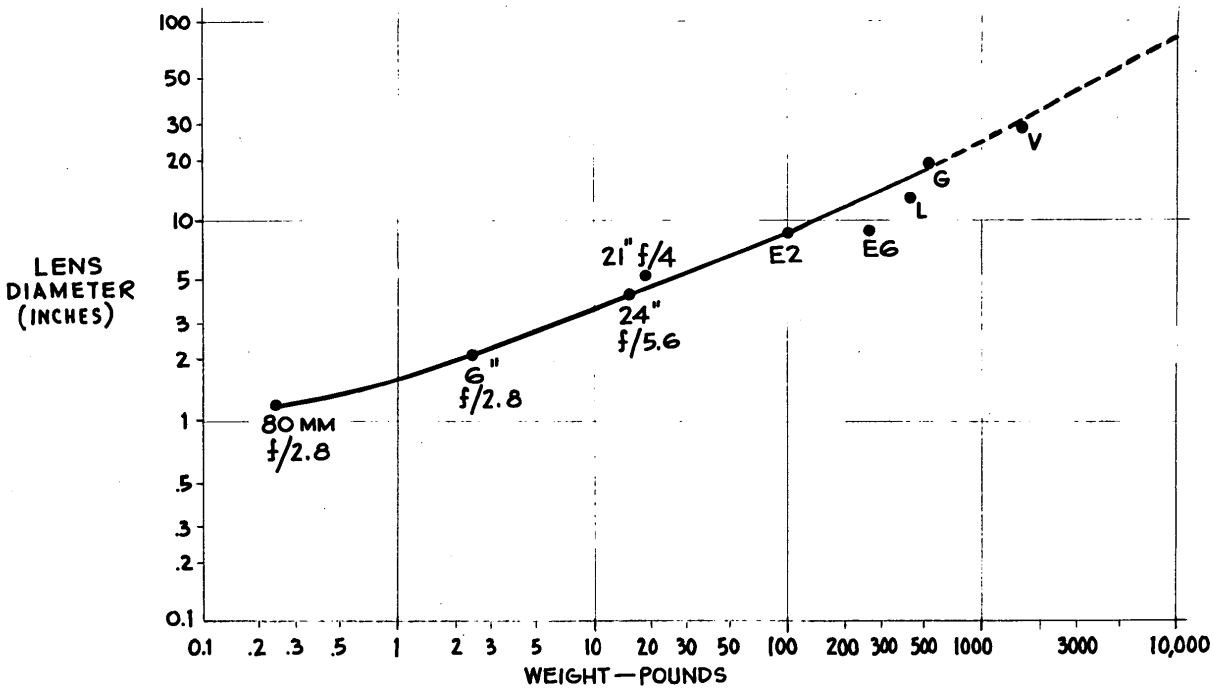
WEIGHT OF OPTICS vs. LENS APERTURE



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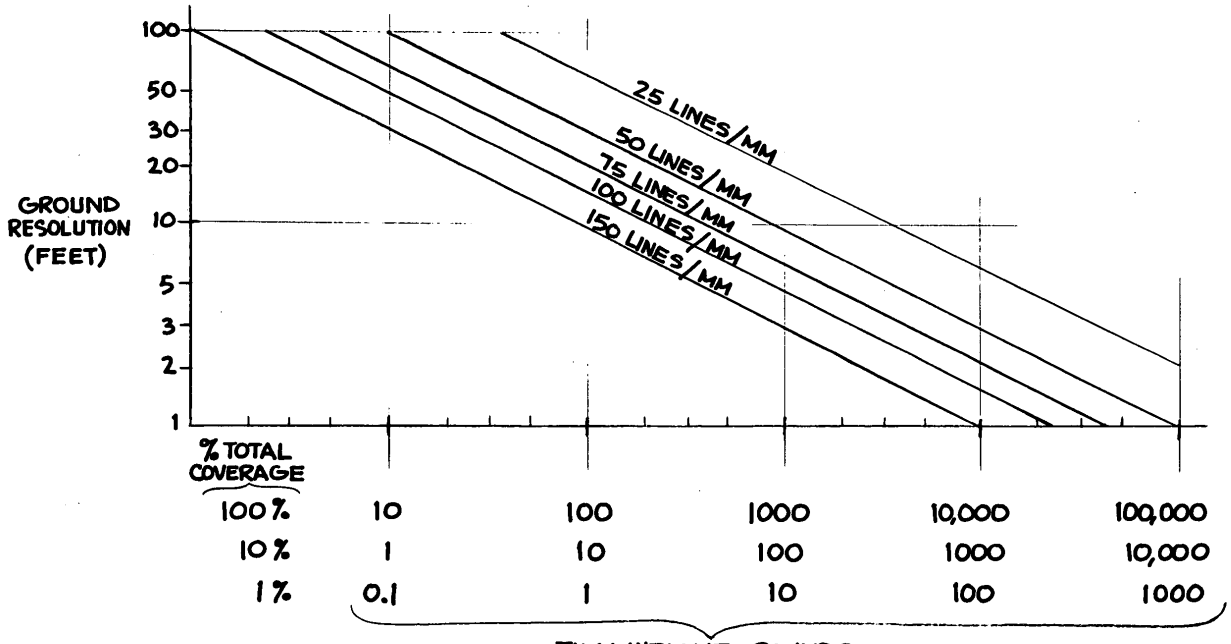
FILM WEIGHT vs. GROUND RESOLUTION



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GENERAL CONCLUSIONS

25X1

1. SPECTRAL REGIONS
   - ⊙ VISIBLE, LIMITED BY LENS CORRECTION.
   - ○ [redacted]
2. SMEAR RATE
   - ⊙ DIFFICULT TO IMPROVE UPON ½ mr/sec. ERROR.
3. FILM
   - ○ GROUND RESOLUTION INDEPENDENT OF CURRENT FILM FOR FIXED LENS DIAMETER AND SMEAR RATE.
   - ○ FINE GRAIN FOR MINIMUM WEIGHT AND RADIATION SUSCEPTIBILITY.
4. LENS
   - ⊙ DIAMETER DEPENDS MAINLY ON SMEAR RATE AND REQUIRED ANGULAR RESOLUTION.
   - ⊕ OPTIMUM FOCAL LENGTH EXISTS FOR A GIVEN FILM AND RANGE OF CONDITIONS.

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